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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,501	10/03/2003	Hao-Feng Hung	ACMP0130USA	2500
27765	7590	08/15/2005	EXAMINER	
NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION P.O. BOX 506 MERRIFIELD, VA 22116			HUFFMAN, JULIAN D	
			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 08/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/605,501	Applicant(s) HUNG, HAO-FENG	
	Examiner Julian D. Huffman	Art Unit 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 7-13 is/are rejected.
- 7) ☒ Claim(s) 5 and 6 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/3/03</u> | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4 and 7-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al. (2002/0085053 A1) in view of Kato (U.S. 6,406,113 B1).

Kao et al. discloses:

With regards to claim 1, a method of printing an image on a printing medium with an inkjet printing device (Title, Abstract), the method comprising:

providing data representative of an original image (fig. 7b, element 115, 0058);

calculating a total heat weighting value for the original image to indicate a degree of heat accumulation for the original image (fig. 7a, element 710, 0058);

selecting M image masks to be used to mask the original image, wherein a value of M is chosen according to the total heat weighting value, M being an integer greater than or equal to one (0058);

masking the original image with the M image masks to produce M sub-images;

and

printing the M sub-images successively on the printing medium with a plurality of nozzles for superimposing the M sub-images on the printing medium, whereby the original image is printed on the printing medium (0058).

With regards to claim 2, reading the M image masks from a table memory (fig. 7b, element 741 stores the image masks in a memory along with selection criteria to select the mask based on the heat data, as such, the memory is a table memory).

With regards to claim 3, the M image masks are generated according to a predefined algorithm (0058, location of pixels and heat weighting look-up table are used to generate the image masks).

With regards to claim 7, the total heat weighting value is calculated according to locations of the pixels to be printed and a heat weighting look-up table (0058).

With regards to claim 8, the total heat weighting value is a sum of heat weighting values calculated for each row of nozzles contained in a printhead of the inkjet printing device (0046, pixels are printed by nozzle rows).

With regards to claim 9, the total heat weighting value is calculated before each swath that the printhead makes over the printing medium (Abstract, 0058).

With regards to claim 11, the inkjet printing device is an inkjet printer having a printhead comprising a plurality of nozzles to jet ink droplets on the printing medium so as to form the image on the printing medium (0006).

With regards to claim 12, the data representative of the original image is gray-scale image data (0067).

With regards to claim 13, the data representative of the original image is color image data (0067).

The aforementioned embodiment of Kao et al. (figs. 7a and 7b) does not disclose, with regards to claim 4, that the predefined algorithm comprises:

(a1) choosing every Mth nozzle to be included in a first mask;

(a2) repeating step (a1) for selecting a second mask through an (M-1)th mask, wherein nozzles that were previously chosen to be included in other masks are not included in any additional masks; and

(a3) choosing all remaining nozzles to be included in an M mask.

However, the embodiment of fig. 3a of Kao discloses a mask pattern which is selected according to a predefined algorithm comprising:

(a1) choosing every Mth nozzle to be included in a first mask (fig. 3a, there are a total of 2 masks, in mask 310, in each row every other nozzle is chosen in the first mask);

(a2) repeating step (a1) for selecting a second mask through an (M-1)th mask, wherein nozzles that were previously chosen to be included in other masks are not included in any additional masks (fig. 3a, a second mask 320 is selected according to an M-1 or first mask, such that nozzles not previously chosen are included in other masks); and

(a3) choosing all remaining nozzles to be included in an M mask (fig. 3a, in the second mask, all remaining nozzles are chosen).

It would have been obvious to one having ordinary skill in the art at the time of the invention to use the mask algorithm in the embodiment of fig. 3a of Kao et al. as a print mask algorithm in the initially discussed embodiment of figs. 7a and 7b of Kao et al. for the purpose of providing print masks which reduce heat accumulation during printing (0037).

Kao et al. does not disclose comparing the total heat weighing value to R distinct reference values, R being an integer greater than or equal to one, and selecting the image masks based on the comparison results, wherein M is less than or equal to $R+1$ (refer to claim 10).

However, Kato discloses comparing heat values to R distinct reference values, R being an integer greater than or equal to one and selecting sub-images M based on the result of comparison, wherein M is less than or equal to $R+1$ (environmental temperature is detected and compared to a reference table which lists reference environmental temperatures and corresponding threshold print duties, based on results of comparison of the detected environmental temperature and the print duty, sub-images are selected to reduce the print duty, the sub-images reduce the number of nozzles used in a print period to lower the print duty, fig. 14, column 11, lines 38-63, Kato discloses a table including a larger number of values, far greater than the number of sub-images, thereby providing accurate compensation for the various temperatures detected).

It would have been obvious to one having ordinary skill in the art at the time of the invention to modify Kao et al. to use a comparison table to compare the detected total heat weighing values to R reference heat weighing values and to select the image masks M based on the result of comparison, wherein the number of masks M is less than or equal to $R+1$, as suggested by Kato, for the purpose of providing more *efficient* processing to select the masks which most *accurately* correspond with the heat value (processing time is more efficient since the table does not require complex analysis of the temperature to determine the appropriate selection of image masks and accuracy of selection is increased due to the large number of entries in the table).

Allowable Subject Matter

3. Claims 5 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The primary reason for the indication of allowability of claim 5 is the inclusion of the method steps of printing an image in a printing medium with an inkjet printing device including:

generating M image masks according to a predefined algorithm, the algorithm comprising:

choosing contiguous groups of N nozzles to be included in a first mask, wherein each group of N nozzles included in the first mask is separated by $(M-1)*N$ nozzles not included in the first mask, N being an integer greater than or equal to one.

It is this step found in the claim, as claimed in the combination of, that has not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

The primary reason for the indication of allowability of claim 6 is the inclusion of the method steps of printing an image in a printing medium with an inkjet printing device including:

generating M image masks according to a predefined algorithm, the algorithm comprising:

analyzing a group of M nozzles closest to the current nozzle, wherein the group of M nozzles have not been previously chosen or analyzed for inclusion in the first mask; and

selecting among the group of M closest nozzles a next nozzle which is farthest away from the current nozzle, and choosing the next nozzle to be included in the first mask.

It is these steps found in the claim, as claimed in the combination of, that have not been found, taught or suggested by the prior art of record, which makes this claim allowable over the prior art.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. 6,641,242 B2 to Canti et al. Canti et al. discloses predicting head temperature and in response to the predicted head temperature, dividing a print mask into a plurality of sub-masks.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian D. Huffman whose telephone number is (571) 272-2147. The examiner can normally be reached on 9:30a.m.-6:00p.m. Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Julian D. Huffman
12 August 2005